Faculty of Engineering Kasetsart University

Midterm Examination, 2nd Semester, 2015 / 2016 — Section 450
01219343 Software Testing and Software Project Management — Lecturer: Uwe Gühl
Friday, 26th of March, 2016 — 1.00 pm until 2.30 pm

Name:_____ ID:_____

Points:_____/ 60 Mark:_____

Instructions: Read the following guidelines thoroughly before starting working on the exam

1 Nature of exam and scoring rules

1.1 There are Multiple-Choice-Questions and open questions on next pages. Maximum 60 points are available. You should attempt to complete every question. The exam spans 14 pages in total, including this cover page.

1.2 For the Multiple-Choice-Questions: Choose only ONE choice that you believe is correct (or most suitable). Mark your selected choice with a crossing sign (X) for each respective problem.
Marking more than one choice for each problem is considered invalid and no points will be given.
Exception: For question 4.5 select for each topic a crossing sign (X) in the correct column.

1.3 For the open questions: Enter the correct answer.

1.4 The points to be achieved are listed in every question.

2 Exam policy during exam session

2.1 No books, lecture notes, or any kind of documents, including calculators, are permitted.

2.2 Use only blue or black inked pens to write your name, student ID, on the exam sheet.

2.3 Do NOT separate any exam page from the exam set, or it will be considered an attempt to cheat.

2.4 Turn off all communication devices, or it will be considered an attempt to cheat.

2.5 No discussions/talking among students are permitted, or students involved will be considered cheating.

2.6 At the expiration of exam time, students are to return the complete exam set to the exam proctor.

3 Policy for cheating

Should you be caught for an attempt to cheat, regardless of the situations, you will automatically be given an F grade for this course, and be reported to the board of exam committees for further necessary disciplined penalties by the dean and chancellor offices.

Board of Examination Committee	
Peerayuth Charnsethikul	(Head of Committee Members)
Anan Phonphoem	(Committee Member)
Arnon Rungsawang	(Committee Member)
Uwe Gühl	(Committee Member)

1 Fundamentals of Project Management [/ 6]

1.1 What is a project? [/ 1]

- A temporary endeavour undertaken to create a unique product, service, or result.

1.2 What are characteristics of a project? [/ 2]

- Temporal limitation
  There is a beginning and an end.
- Uniqueness
  Typically it is something new.
- Defined objective
  Result could be for example a product, a system or a process.
- Adequate complexity
- Inter-divisional
  This is valid for big organizations.
- Limited resources

1.3 Name not less than three success factors for projects. [/ 2]

- User Involvement
- Executive Management
- Clear Statement of Requirements
- Proper Planning
- Realistic Expectations
- Smaller Project Milestones
- Competent Staff

1.4 Why do companies use project process models? [/ 1]

- To effectively identify stakeholders and project members in projects ☐
- To optimize the situation analysis ☐
- To ensure continuous project management quality in using same procedures and similar documentation methods ☒
- To achieve confidence about project objectives and results ☐

2 Requirements Engineering [/ 10]

2.1 Why should requirements be prioritized? [/ 1]

a) to shorten the time required for developing and testing ☐
b) to focus on the most important topics and to detect requirements issues early ☒
c) to ensure that all requirements will be covered in testing ☐
d) to better find corresponding stakeholders ☐

2.2 How do requirements engineers and tester cooperate? [/ 1]

a) The requirements engineer delivers input for a tester ☒
b) The tester monitors the work of the requirements engineer ☐
c) The output of the requirements engineer is managed by the tester ☐
d) The tester delivers input for a requirements engineer ☐

2.3 Which of following requirements refer to a system to be realized? [/ 1]

a) The daily test reports have to be delivered until 8 pm every day ☐
b) The supplier has to process a change request within three days ☐
c) The response time must not be more than 3 seconds in 95 % of the cases ☒
d) Configuration management has to be done using the SVN tool ☐

2.4 Requirement specification [/ 2]

For a system that should deal with images of concept vehicles following requirement is given:

- Req011 An easy User Interface has to be done according to requirements of newspaper corporations and car companies

a. What are the problems with this requirement? [/ 1]
_What is an “easy” User Interface?_____
_The detailed requirements of a Newspaper cooperation and car company are not listed;
_the requirement covers two requirements from different stakeholders

b. Write a proposal, how the requirement could be improved. [/ 1]

_Req001a A car company should be able to upload concept vehicle images_____
_Req001b A newspaper cooperation should be able to retrieve concept vehicle images_____

2.5 User Stories for requirements [/ 3]

Following requirement could be found in a specification:

> In an item delivery shop are different kinds of user defined.
> - A customer wants an item to be transported from A to B.
> - A transporter offers a service to transport an item from A to B.
>
> A deal is generated, when a customer found a transporter for his transportation request. The deal is done, when the item was successfully delivered.
> An operator should have the possibility to see how many people visited the item delivery shop and what business volume every deal generated.

Write 3 User Stories out of the requirement specification. Use following template:
As a <type of user>, I want <some goal> so that <some reason>.

- As a customer person I want to find a transporter, so that my item gets transported from A to B.
- As a transporter I want to find a customer, so that I can make money in transporting an item from A to B.
- As an operator I want to see how many deals have people visited the item delivery shop, so that I know how successful the item delivery shop is
- As an administrator I want to see what business volume every deal generated, so that I know my business better concerning strength and weakness.

2.6 Which of following statement concerning roles is TRUE? [/ 1]

a) For the end users, the requirements have to be implementable. ☐
b) For the operation users, the requirements have to be prioritized. ☐
c) For all roles in the project, the requirements have to be consistent. ☒
d) For the testers, the requirements have to be easily changeable. ☐

2.7 Which statement is WRONG concerning unique identifiers of requirements? [/ 1]

a) Unique identifiers ease the traceability to other project artifacts. ☐
b) Unique identifiers help in establishing links to other requirements. ☐
c) Unique identifiers ease the communication, as they are unambiguous. ☐
d) Unique identifiers help to estimate the size of the specification. ☒

3 Comprehensive Project Management Topics [/ 10]

3.1 What are the processes for quality management following the PMBOK-Guide? [/ 1]

a) Quality planning, quality assurance, quality control ☒
b) Quality assurance, quality processes, quality support ☐
c) Quality strategy, quality plan, quality execution, quality closure ☐
d) Quality support, quality control, quality summary report ☐

3.2 Which statement is TRUE? [/ 1]

a) The project manager controls the influence of stakeholders with soft skills. ☐
b) The influence of stakeholders is constant during the lifecycle of a project. ☐
c) The influence of stakeholders is highest at the beginning of the project and decreases during the project execution. ☒
d) The quality of change requests is representing the influence of stakeholders. ☐

3.3 Why should one create and maintain a communication plan in a project? [/ 1]

a) The communication plan is required for an effective situation analysis. ☐
b) The communication plan helps to improve the quality of the work breakdown structure. ☐
c) The communication plan is an essential part of project documentation. ☐
d) The communication plan helps to improve the relationship to stakeholders, to understand their needs and to identify risks as soon as possible. ☒

3.4 What is missing MOST in following minutes entry? [/ 1]

No.	(A)ction Item (D)ecision (I)nformation	Priority	Description	Responsible	Status	Due date
			As requested by Gai, someone of the team should develop the user interface		open	03.04.16

a) No. (Number for distinct identification) ☐
b) (A) for Action Item ☐
c) Priority ☐
d) Responsible ☒

3.5 Which of the following could improve the project culture? [/ 1]

a) If someone failed in the project team, the person should be clearly addressed. ☐
b) The project team is requested to show fairness and respect to each other. ☒
c) Responsibilities concerning tasks in the project should be assigned in status meetings only. ☐
d) The project team should regularly listen to opinions of the project manager to improve the communication. ☐

3.6 Review of a project profile ("One pager") [/ 3]

Project name	*Cook 4 You*	**Project No.**	*17100*
Principal	*Mr. Lu*		
Project manager	*Mot*		
Project team	*Tan, Pet, Nut*		
Stakeholder	*Buyer (people who need food), Provider (cook, restaurant)*		
To be informed	*Mr. Lu*		
Project start	*Oct 2015*	**Project end**	*April 2015*
Objectives	*Create matching software for people who want to buy food and people who can provide.*		
Project scope	*Usable website*		
Milestones	*- Buyer request their need & Provider search for job* *- Other support features such as authentication, payment, support etc.*		
Value	*Show to investor.*		

Describe what could be improved in the extract of a project profile above.

- Mr. Lu is the principal, so has not to be listed in "To be informed"
- Project start and project end should have exact dates (dd.mm.yyyy).
- Project end is earlier than project start.
- Objective should describe a project goal as clear as possible. E.g. a software could be a web site, as stand alone program, a smart phone app.
- "Usable website" is too short and to general. Headlines of work packages should be listed.
- Milestones should have dates.
- Milestone "Other support features" could not be measured
- "Show to investor" is not a value

3.7 What does PDCA (Deming Cycle) stand for? [/ 1]

a) Problem, design, control, assess ☐
b) Plan, do, check, act ☒
c) Problem, diagnosis, conclusion, action ☐
d) Plan, design, create, assess ☐

3.8 What should be part of the project handbook? [/ 1]

a) Project order, project plan, org chart, status reports ☒
b) Company organization chart, corporate design guidelines, contact to the HR department ☐
c) Project support organization, copy of project strategy of the company ☐
d) User manual, administration guide, help strategy ☐

4 Strategy Phase [/ 6]

4.1 Who should sign the project order? [/ 1]

a) Steering Committee and Project Manager ☐
b) Principal and Project Manager ☒
c) Principal, Project Manager and Quality Management ☐
d) Steering Committee and Principal ☐

4.2 What is NOT true about project objectives? [/ 1]

a) Not for every goal there should be a responsible stakeholder ☒
b) Acceptance criteria should be defined ☐
c) Operationalization of the goals is recommended ☐
d) Prioritization should be used ☐

4.3 Who is responsible for committing a potential team member to the project? [/ 1]

a) Potential team member itself ☐
b) Superior of the potential team member ☒
c) Project manager ☐
d) Principal ☐

4.4 Why do you execute an environment analysis? [/ 1]

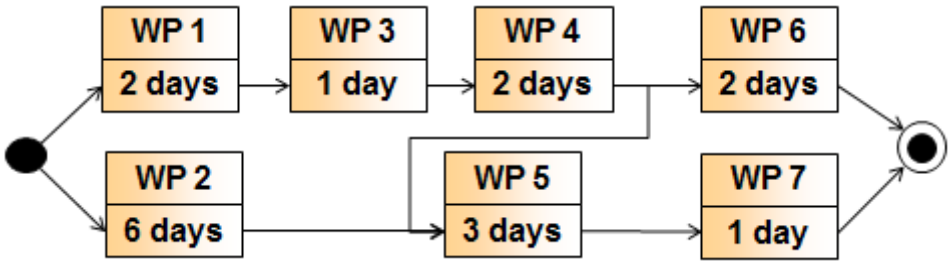
a) To identify stakeholders and to clarify how to involve them ☒
b) To understand the basic problem of a project ☐
c) To understand the motivation of the principal ☐
d) To clarify the needs of the customer ☐

4.5 Decide, if the following are project risks or product risks [/ 2]

Topic	Project risk	Product risk
System crashes, when entering too many character.		x
Delay of delivery of test build to the test team.	x	
Performance decreases with more than 10 user.		x
Low usability, so user leave web shop and do not buy items.		x

5 Planning Phase [/ 10]

5.1 What is the critical path in following time plan? [/ 1]



a) WP 2, 5 ☐
b) WP 1, 2, 3, 4, 5, 6, 7 ☐
c) WP 1, 3, 4, 5, 7 ☐
d) WP 2, 5, 7 ☒

5.2 What is the basic document in the planning phase? [/ 1]

a) Situation analysis ☐
b) Work breakdown structure (WBS) ☒
c) Communication plan ☐
d) Risk management plan ☐

5.3 Project Planning [/ 8]

Following information has been collected.

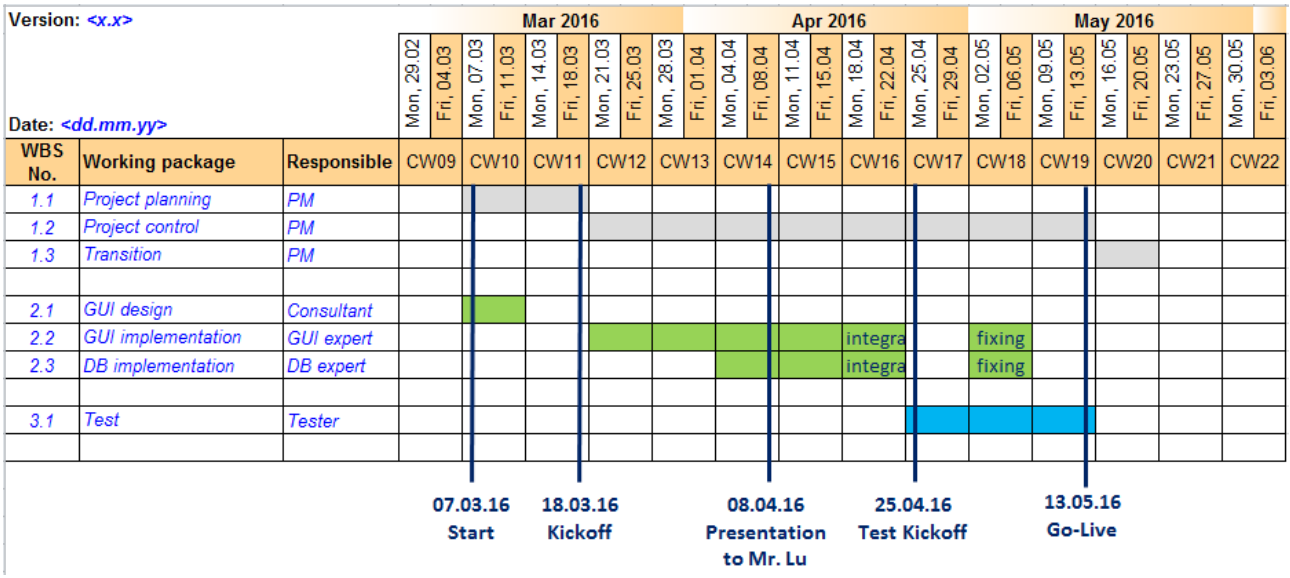
A website for offering and selling novels and poems should be created. Go-Live should be done on a Friday.
The principal is Mr. Lu. He is not available in CW15 and CW16. He would like to celebrate a project kick off. In general he is very interested in project progress.
A testing phase should be about 3 weeks. Required are 2 testers, their weekly rate is about 5.000 Baht. For fixing defects the assumption is, that a database expert is required for one week, and a GUI expert for one week during the testing cycle.
Concerning the design and implementation of a database a database expert is required for 2 weeks, his weekly rate is 20.000 Baht.
The GUI technology to be used is concerning special requirements on risk, a special consultant should be hired separately, evaluate this technology and create a GUI design in a week, his weekly rate is 25.000 Baht.
If the GUI design is done, the GUI could be implemented in about 4 weeks by a GUI expert, his weekly rate is 5.000 Baht.
Integration of GUI and database should be done in about 1 week in cooperation with Database expert and GUI expert, then testing could start.
Planned project management activities are project planning (2 weeks) and project control (as long as required). Additionally one week after Go-Live project management is required for transition activities. The project manager could start on Monday, 07.03.16, his weekly rate is 15.000 Baht.

a. How many milestones should be planned? List proposed milestones with date and headline. Please give reasons for your proposal [/ 2]

1. Mon, 07.03.2016 Project Start
   Project Manager could start on 07.03.16
2. Mon, 21.03.2016 Project Kickoff
   Kickoff after project planning is done. As the special consultant should be hired separately, he won't be in the project team. His work can be done in parallel to project planning.
3. Fri, 08.04.2016 Intermediate presentation for Mr. Lu.
   Mr. Lu is absent in CW15 and CW16
4. Mon, 25.04.2016 Test Kickoff
   Integration should have been done successful, test could start, Mr. Lu is back
5. Fri, 13.05.2016 Go- Live
   Go- Live should be executed on a Friday, testing phase is finished

b. Do a time schedule planning, please use the time schedule template next page. When is the Go-Live earliest possible? [/ 3]

_____Fri, 13.05.2016_____



c. Generate a personnel cost plan based on your time schedule.
What are the estimated overall personnel costs for the project? [/ 3]

330.000 Baht

WBS No.	Working package	Number of resources	Weeks	Rate	Costs
1	Project management	1	11	฿15.000	฿165.000
2.1	GUI design	1	1	฿25.000	฿25.000
2.2	GUI implementation	1	6	฿5.000	฿30.000
2.3	DB	1	4	฿20.000	฿80.000
3.1	Test	2	3	฿5.000	฿30.000
Personnel costs					฿330.000

6 Execution and Closure Phase [/ 6]

6.1 What is a prerequisite for project control? [/ 1]

a) Situation analysis ☐
b) Project quality plan ☐
c) Project plan ☒
d) Change management process ☐

6.2 Project control [/ 3]

Today is the 26th of February 2016, you as a project manager got work package (WP) status reports, summarized below. What are next actions to do for you?

No.	Work package	Responsible	Priority	Due date	Status	Comment
1.1	Art design	Nok	medium	12.02.16	done	
1.2	Implement css	Nok	medium	19.02.16	done	Tests on IE and Chrome will be done, should be no problem
3.1	Implement DB	Phi	medium	26.02.16	in progress	Started on 04.01.16; 90% done
3.2	Connect to infrastructure	Phi	medium	11.03.16	in progress	
4.1	Server auth	Jo	low	25.03.16	in progress	Working hard to get it done
4.2	Server DB	Jo	high	18.03.16	open	

- WP 1.2 is not “done”, if testing activities are still open.
  Nok should be asked, how much effort is required, until when testing will be done.
  Then it might be necessary to update the project plan.
- WP 3.1 is on risk, as today is the 26th of February (“90 % trap”).
  Proceeding to be clarified with Phi.
- Jo works on WP 4.1, but WP 4.2 has higher priority and should be finished earlier.
  It should be clarified with Jo, if he could focus on WP 4.2.

6.3 What is TRUE concerning the final approval? [/ 1]

a) It’s possible that the principal gives only partial approval. ☒
b) The principal must approve the project result. ☐
c) The project manager may approve the project result, if the project teams agrees. ☐
d) The approval can only be given in a final project closure meeting. ☐

6.4 Why should there be a final documentation of the project? [/ 1]

a) To tailor a framework for new projects ☐
b) To have a complete documentation ☐
c) To evaluate the performance of the project team ☐
d) To exceed the project management know-how in a company ☒

7 Fundamentals of Testing [/ 6]

7.1 What is the goal of Software Tests? [/ 1]

- Finding defects
- High test coverage
- Statements concerning software quality

7.2 Which of the following is NOT an exit criteria? [/ 1]

a) Measures concerning code coverage, functionality or risk ☐
b) Verifying the test environment ☒
c) Remaining risk like lack of test coverage in defined areas or open defects ☐
d) Guesses of defect density or reliability measures ☐

7.3 How do you call something that is incorrect in software? [/ 1]

a) An error ☐
b) A failure ☐
c) A mistake ☐
d) A defect ☒

7.4 Which of the following is a benefit of test independence? [/ 1]

a) It does not require familiarity with the code ☐
b) It is less expensive than using developers to test their own code ☐
c) It avoids author bias in defining effective tests ☒
d) Testers are more efficient at finding defects than developers ☐

7.5 Which of the following is NOT an activity in the Fundamental Test Process? [/ 1]

a) Test Planning and Control ☐
b) Test Implementation and Execution ☐
c) Test Automation activities ☒
d) Evaluating Exit criteria and reporting ☐

7.6 Why is it typically not possible to do exhaustive testing, meaning to test all inputs and preconditions? [/ 1]

- Due to the combinatorial explosion of input parameter, complete testing is neither theoretically, nor practically possible.

8 Testing Throughout the Software Life Cycle [/ 6]

8.1 Which of the following are ALL software characteristics following ISO/IEC 9126? [/ 1]

a) Functionality, Reliability, Supportability, Efficiency ☐
b) Scalability, Portability, Functionality, Reliability ☐
c) Usability, Supportability Maintainability, Functionality ☐
d) Portability, Usability, Efficiency, Reliability ☒

8.2 Describe the difference between verification and validation following ISTQB [/ 1]

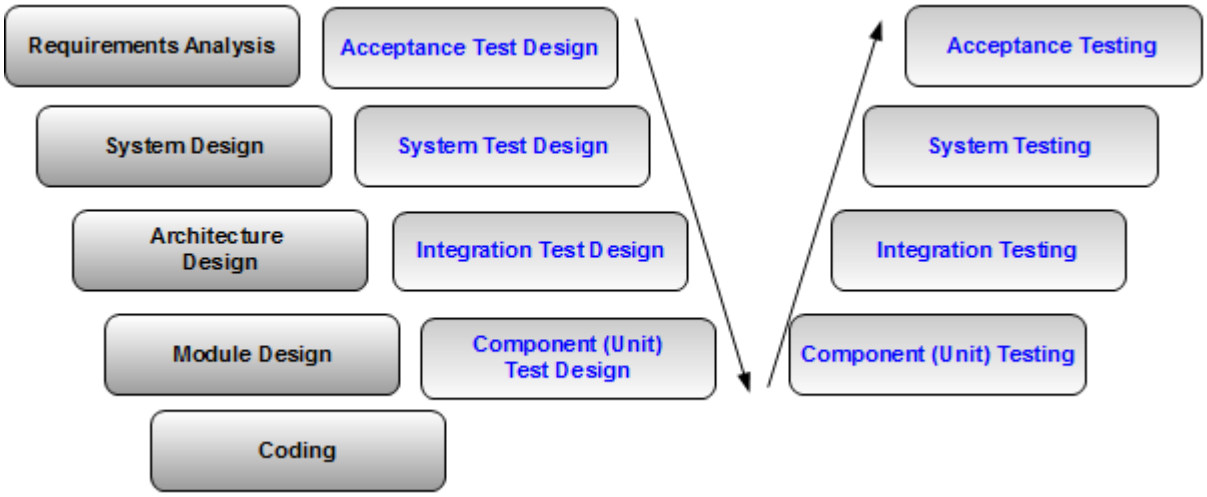
Verification – Did we build the product right?
Verification is defined as the "demonstration of consistency, completeness, and correctness of the software at each stage and between each stage of the development life cycle."
Validation – Did we build the right product?
Validation is the "determination of the correctness of the final program or software produced from a development project with respect to the user needs and requirements. Validation is usually accomplished by verifying each stage of the software development life cycle."

8.3 Why is a bidirectional traceability between test conditions and requirements requested? [/ 1]

a) for impact analysis when requirements change ☒
b) to better assign testers to corresponding test cases ☐
c) for better calculation of the test effort in test execution phase ☐
d) to optimize defect reports ☐

8.4 V-Model [/ 2]

Add the testing and test preparation activities, integrated into each phase of the software development lifecycle according to the extended V-Model below following ISTQB.



8.5 Describe the difference between “Component Integration Testing” and “System Integration Testing”. [/ 1]

- Component integration testing
  tests the interactions between software components and is done after component testing.
- System integration testing
  tests the interactions between different systems or between hardware and software and may be done after system testing.